

*Terrestrial Field  
Dissipation*

## DATA EVALUATION RECORD

CHEM 053201

STUDY 3  
Methyl Bromide

§164-1

FORMULATION--90--FORMULATION NOT IDENTIFIED

STUDY ID 00013173

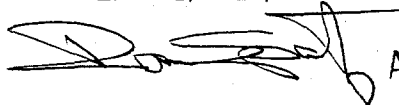
Abdalla, N., D.J. Raski, B. Lear, et al. 1972. Distribution of methyl bromide in soils treated for nematode control in replant vineyards. Unpublished study received Oct. 3, 1973 under 5785-EX-26; prepared by Univ. of California--Davis, Dept. of Nematology, submitted by Great Lakes Chemical Corp., West Lafayette, IN; CDL:210143-C.

DIRECT REVIEW TIME = 4

|              |                                      |                        |
|--------------|--------------------------------------|------------------------|
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AUG 15 1990

This study was previously reviewed by Dynamac in 1985. A copy of the review is included in this document because it provides useful information for the ground water assessment; the study was not reevaluated because no new information has been provided to date in response to the previous review.

CONCLUSIONS:Field Dissipation - Terrestrial

1. This study cannot be used to fulfill data requirements.
2. Methyl bromide, at 136.2-363.2 kg/ha, dissipated with half-lives of <3 to <7 days at a 1-foot sampling depth from field plots in California. Concentrations of methyl bromide were lower at all sampling intervals and soil depths when applied without a polyethylene cover. Concentrations at the 4- to 8-foot depths generally increased while the polyethylene covers were in place.



3. This study is scientifically sound, but does not meet Subdivision N guidelines for the following reasons:

complete field test data, including meteorological data and application procedures, were not provided;

the test soils were not completely characterized;

the test substance was not characterized; and

the plots at the St. Helena site were not sampled until 4 days posttreatment.

4. After application, methyl bromide was found at soil depths of up to 8 feet. Therefore, methyl bromide is sufficiently mobile to contaminate ground water.

#### METHODOLOGY:

Fallow and Sudan grass-covered field plots (Table 1) located in California were treated with methyl bromide (test substance uncharacterized) at 136.2-363.2 kg/ha. In several of the plots, the methyl bromide was applied under a polyethylene cover; one plot was lightly sealed with water after treatment; the remaining plots were not covered (details of the experimental procedures are given in Tables 2-7). Samples were collected at soil depths up to 8 feet at various intervals up to 21 days posttreatment using stainless steel sampling probes. The soil was analyzed for methyl bromide using GC.

#### DATA SUMMARY:

Methyl bromide, at 136.2-363.2 kg/ha, dissipated rapidly from the 1-foot sampling depth of all field plots (Tables 2-7). Concentrations at all depths were appreciably lower when methyl bromide was applied without a polyethylene cover. While the covers were in place, methyl bromide concentrations at lower soil depths generally increased. There was no appreciable difference in methyl bromide dissipation between fallow or grass-covered plots.

#### COMMENTS:

1. Field test data, including application procedures and meteorological data, were not provided.
2. The test substance was not characterized. Complete soil characteristics, such as organic matter content, pH, and CEC, were not reported.
3. No preapplication soil samples were taken, and soil samples were not taken from plots at the St. Helena site that were treated at 181.6 and 272.4 kg/ha until 4 days after treatment.
4. It could not be determined whether application rates were given as kilograms of product or kilograms of active ingredient per hectare.
5. The reported concentrations of methyl bromide in soil (ppm) represent the amount of methyl bromide gas in a volume of soil air space.

## TABLES/FIGURES

Table 1. Soil characteristics.

| Plot location       | Soil type       | Sand | Silt | Clay |
|---------------------|-----------------|------|------|------|
|                     |                 | %    |      |      |
| St. Helena          | Sandy clay loam | 53.0 | 25.5 | 21.5 |
| Delano <sup>a</sup> | Sandy loam      | 74.0 | 18.0 | 8.0  |
| Arvin               | Sandy loam      | 63.0 | 24.0 | 13.0 |
| Lodi                | Sandy loam      | 73.0 | 15.0 | 11.0 |
| Delano              | Sandy loam      | 62.0 | 24.5 | 14.5 |

<sup>a</sup> Two of the six field plots were in this location.

Table 2. Methyl bromide concentrations (ppm) in soil (St. Helena, California) treated at 136.2-363.2 kg/ha.<sup>a</sup>

| Sampling<br>depth<br>(feet)           | 136.2 kg/ha              |      |      |     | 181.6 kg/ha |      |      |      | 272.4 kg/ha |      |      |      | 363.2 kg/ha |      |      |      |
|---------------------------------------|--------------------------|------|------|-----|-------------|------|------|------|-------------|------|------|------|-------------|------|------|------|
|                                       | Sampling interval (days) |      |      |     |             |      |      |      |             |      |      |      |             |      |      |      |
|                                       | 1                        | 4    | 8    | 14  | 4           | 6    | 11   | 14   | 4           | 6    | 11   | 14   | 1           | 4    | 8    | 14   |
| Sudan grass covered area <sup>b</sup> |                          |      |      |     |             |      |      |      |             |      |      |      |             |      |      |      |
| 1                                     | 2700                     | 1000 | 200  | 50  | 1350        | 850  | 200  | 100  | 1300        | 1000 | 200  | 100  | 7600        | 2700 | 1200 | 600  |
| 4                                     | 4800                     | 2500 | 900  | 250 | 4050        | 2850 | 1000 | 500  | 3800        | 3300 | 1300 | 700  | 5300        | 2750 | 1400 | 600  |
| 6                                     | 1500                     | 1700 | 800  | 200 | 5000        | 3800 | 1700 | 1200 | 3700        | 3500 | 1700 | 1200 | 3200        | 6000 | 3500 | 2000 |
| 8                                     | 300                      | 700  | 600  | 300 | 4000        | 3400 | 1800 | 1300 | 1900        | 2100 | 1800 | 1600 | 1200        | 5000 | 4000 | 3000 |
| Fallow area <sup>b</sup>              |                          |      |      |     |             |      |      |      |             |      |      |      |             |      |      |      |
| 1                                     | 2100                     | 800  | 100  | 50  | 1100        | 500  | 50   | 30   | 700         | 300  | 70   | 60   | 3100        | 800  | 150  | 100  |
| 4                                     | 4050                     | 2300 | 1100 | 200 | 1750        | 1450 | 500  | 200  | 1800        | 1300 | 200  | 100  | 4400        | 1900 | 1400 | 700  |
| 6                                     | 1950                     | 2000 | 1000 | 400 | 1700        | 1500 | 900  | 600  | 2100        | 1900 | 900  | 500  | 900         | 3000 | 2600 | 1600 |
| 8                                     | 300                      | 800  | 800  | 450 | 1650        | 1600 | 1000 | 700  | 3000        | 3000 | 1950 | 1400 | 800         | 4000 | 3600 | 2300 |

<sup>a</sup> Field plot (~2.02 ha) divided into eight subplots, half of which were planted to Sudan grass prior to treatment with methyl bromide at a soil depth of 61 cm (2 feet).

<sup>b</sup> Methyl bromide was applied under polyethylene cover.

Table 3. Methyl bromide concentrations (ppm) in soil (Delano, California) treated 136.2 and 181.6 kg/ha.<sup>a</sup>

| Sampling<br>depth<br>(feet) | 136.2 kg/ha <sup>b</sup> |      |      |     | 181.6 kg/ha <sup>b</sup> |      |      |     | 181.6 kg/ha <sup>c</sup> |      |     |     |
|-----------------------------|--------------------------|------|------|-----|--------------------------|------|------|-----|--------------------------|------|-----|-----|
|                             | Sampling interval (days) |      |      |     |                          |      |      |     |                          |      |     |     |
|                             | 1                        | 3    | 11   | 19  | 1                        | 3    | 11   | 74  | 1                        | 3    | 11  | 19  |
| 1                           | 4750                     | 2550 | 700  | 100 | 6050                     | 2600 | 700  | 100 | 1200                     | 700  | 100 | 0   |
| 4                           | 3700                     | 2800 | 800  | 250 | 3700                     | 3600 | 900  | 400 | 1650                     | 1300 | 200 | 50  |
| 6                           | 1600                     | 2350 | 900  | 300 | 1400                     | 2600 | 1100 | 400 | 400                      | 500  | 250 | 50  |
| 8                           | 900                      | 1650 | 1100 | 400 | 150                      | 1400 | 1300 | 600 | 150                      | 200  | 250 | 150 |

<sup>a</sup> Field plot (1.03 ha) planted to Sudan grass prior to treatment with methyl bromide at a soil depth of 61 cm (2 feet).

<sup>b</sup> Methyl bromide applied under polyethylene cover; tarp removed after 11 days.

<sup>c</sup> No cover.

Table 4. Methyl bromide concentrations (ppm) in soil (Arvin, California) treated at 181.6 and 272.4 kg/ha.<sup>a</sup>

| Sampling<br>depth<br>(feet) | 181.6 kg/ha <sup>b</sup> |      |     | 181.6 kg/ha <sup>c</sup> |      |     | 27.4 kg/ha <sup>b</sup> |      |     | 272.4 kg/ha <sup>c</sup> |      |     | 181.kg/ha <sup>d</sup> |      |     |
|-----------------------------|--------------------------|------|-----|--------------------------|------|-----|-------------------------|------|-----|--------------------------|------|-----|------------------------|------|-----|
|                             | Sampling interval (days) |      |     |                          |      |     |                         |      |     |                          |      |     |                        |      |     |
|                             | 1                        | 3    | 16  | 1                        | 3    | 16  | 1                       | 3    | 16  | 1                        | 3    | 16  | 1                      | 3    | 16  |
| 1                           | 2100                     | 800  | 100 | 2200                     | 700  | 50  | 3500                    | 950  | 100 | 2850                     | 800  | 100 | 6350                   | 2700 | 400 |
| 4                           | 2900                     | 1500 | 150 | 2500                     | 1600 | 150 | 4650                    | 250  | 300 | 4300                     | 2500 | 300 | 3850                   | 3500 | 700 |
| 6                           | 1000                     | 1350 | 200 | 500                      | 1200 | 200 | 1300                    | 1950 | 400 | 1600                     | 2000 | 400 | 1500                   | 2350 | 900 |
| 8                           | 150                      | 700  | 250 | 100                      | 550  | 250 | 200                     | 1100 | 500 | 200                      | 950  | 450 | 200                    | 1300 | 900 |

<sup>a</sup> Fallow field plot (5.05 ha) treated with methyl bromide at a soil depth of 61 cm (2 feet).

<sup>b</sup> Light water seal applied after treatment.

<sup>c</sup> No cover.

<sup>d</sup> Methyl bromide applied under polyethylene cover.

Table 5. Methyl bromide concentrations (ppm) in soil (Lodi, California) treated at 136.2 and 181.6 kg/ha.<sup>a</sup>

| Sampling<br>depth<br>(feet) | 136.2 kg/ha <sup>b</sup> |      |      |     | 181.6 kg/ha <sup>b</sup> |      |      |     |
|-----------------------------|--------------------------|------|------|-----|--------------------------|------|------|-----|
|                             | Sampling interval (days) |      |      |     |                          |      |      |     |
|                             | 1                        | 3    | 7    | 21  | 1                        | 3    | 7    | 21  |
| 1                           | 4400                     | 3000 | 1500 | 50  | 9100                     | 4200 | 2100 | 300 |
| 4                           | 1850                     | 2250 | 1950 | 350 | 3000                     | 4300 | 2750 | 450 |
| 6                           | 100                      | 700  | 1100 | 400 | 150                      | 1050 | 1600 | 650 |
| 8                           | 10                       | 100  | 450  | 450 | 20                       | 400  | 950  | 750 |

<sup>a</sup> Fallow field plot (2.26 ha) treated with methyl bromide at a soil depth of 61 cm (2 feet).

<sup>b</sup> Methyl bromide applied under polyethylene cover.



Table 6. Methyl bromide concentrations (ppm) in soil (Delano, California) treated at 136.2-272.4 kg/ha.<sup>ab</sup>

| Sampling<br>depth)<br>(feet | 136.2 kg/ha              |      |     |     | 181.6 kg/ha |      |     |     | 227.0 kg/ha |      |      |     | 272.4 kg/ha |      |      |     |
|-----------------------------|--------------------------|------|-----|-----|-------------|------|-----|-----|-------------|------|------|-----|-------------|------|------|-----|
|                             | Sampling interval (days) |      |     |     |             |      |     |     |             |      |      |     |             |      |      |     |
|                             | 1                        | 3    | 7   | 14  | 1           | 3    | 7   | 14  | 1           | 3    | 7    | 14  | 1           | 3    | 1    | 14  |
| 1                           | 2850                     | 600  | 180 | 10  | 4950        | 1150 | 250 | 50  | 5250        | 1200 | 400  | 60  | 7250        | 1200 | 400  | 50  |
| 4                           | 1550                     | 1950 | 700 | 150 | 1000        | 2200 | 850 | 150 | 4000        | 3550 | 1500 | 350 | 3800        | 4050 | 1500 | 400 |
| 6                           | 550                      | 1100 | 800 | 300 | 200         | 950  | 850 | 300 | 850         | 3000 | 1500 | 550 | 700         | 3000 | 1700 | 600 |
| 8                           | 50                       | 400  | 600 | 300 | 30          | 400  | 500 | 250 | 50          | 700  | 800  | 500 | 30          | 800  | 1300 | 700 |

<sup>a</sup> Fallow field plot (1.35 ha) treated with methyl bromide at a soil depth of 76-81 cm (2.502.7 feet).

<sup>b</sup> No cover.

Table 7. Methyl bromide concentrations (ppm) in soil (Delano, California treated at 181.6 kg/ha.<sup>a</sup>

| Sampling depth<br>(feet) | Covered                  |      |      | Not covered |      |      |
|--------------------------|--------------------------|------|------|-------------|------|------|
|                          | Sampling interval (days) |      |      |             |      |      |
|                          | 1                        | 3    | 7    | 1           | 3    | 7    |
| Surface <sup>b</sup>     | 6600                     | 300  | 430  | --          | --   | --   |
| 0.25                     | 7100                     | 1100 | 100  | 550         | 250  | 200  |
| 0.5                      | 6200                     | 3100 | 1200 | 2300        | 1300 | 1200 |
| 1                        | 8500                     | 4400 | 2900 | 4100        | 1500 | 1800 |
| 2                        | 9400                     | 5400 | 3700 | 4900        | 2500 | 2300 |

<sup>a</sup> Fallow field plot (3.3 ha) treated with methyl bromide at a soil depth of 71-76 cm (2.3-2.5 feet).

<sup>b</sup> GC reading taken between the polyethylene cover and the soil surface.

CASE GS0335 METHYL BROMIDE STUDY 3

PM PM# 03/23/84

CHEM 053201 Methyl Bromide

BRANCH EFB DISC 30 TOPIC 0505

FORMULATION 90 - FORMULATION NOT IDENTIFIED

FICHE/MASTER ID 00013173 CONTENT CAT 01

Abdalla, N., D.J. Raski, B. Lear, et al. 1972. Distribution of methyl bromide in soils treated for nematode control in replant vineyards. Unpublished study received Oct. 3, 1973 under 5785-EX-26; prepared by Univ. of California--Davis, Dept. of Nematology, submitted by Great Lakes Chemical Corp., West Lafayette, IN; CDL:210143-C.

SUBST. CLASS = S.

DIRECT RVW TIME = 5 1/2 (MH) START-DATE

END DATE

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CONCLUSIONS:Field Dissipation - Terrestrial

1. This study is scientifically valid.
2. Methyl bromide (test substance uncharacterized), at 136.2-363.2 kg/ha, dissipated from field plots in California with half-lives ranging from <3 to <7 days at a 1-foot sampling depth. Concentrations of methyl bromide were lower at all sampling intervals and soil depths when applied without a polyethylene cover. Concentrations at the 4- to 8-foot depths generally increased while the polyethylene covers were in place.
3. This study does not fulfill EPA Data Requirements for Registering Pesticides because the test substance was not characterized, complete field test data were not provided, the test soils were not completely characterized, rainfall and irrigation amounts were not reported, and the formation and decline of degradates was not addressed.

### MATERIALS AND METHODS:

Six field plots (Table 1) located in California were treated with methyl bromide (test substance uncharacterized, source unspecified) at 136.2-363.2 kg/ha, with and without polyethylene covers. Details of the experimental procedures are given in Tables 2-7. Methyl bromide concentrations at soil depths up to 8 feet were determined at various intervals by GC using stainless steel sampling probes.

### REPORTED RESULTS:

Methyl bromide dissipated rapidly from the 1-foot sampling depth of all field plots (Tables 2-7). Concentrations at all depths were appreciably lower when methyl bromide was applied without a polyethylene cover. While the covers were in place, methyl bromide concentrations at lower soil depths generally increased. There was no appreciable difference in methyl bromide dissipation when applied to fallow or grass-covered plots.

### DISCUSSION:

1. The test substance was not characterized.
2. Complete soil characteristics, such as pH, organic matter content, and CEC, were not provided.
3. No preapplication soil samples were taken, and samples were not taken from St. Helena field plots treated at 181.6 and 272.4 kg/ha until 4 days after treatment.
4. Field test data, including slope of test site, depth to water table, and soil and air temperatures, were not provided.
5. It could not be determined whether application rates were given as kilograms of product or kilograms of active ingredient per hectare.
6. Meteorological data were not provided.
7. The formation and decline of degradates was not addressed.
8. Reported concentrations of methyl bromide in soil (ppm) represent the amount of methyl bromide gas in a volume of air.